

DEPARTMENT OF WATER RESOURCES

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NOV 10 2008

TO: Distribution List

Attached is the first annual report to the Chairs of the Senate and Assembly fiscal committees on the Department of Water Resources' (DWR) efforts to reduce dependency on fossil fuels and changes to its portfolio of power contracts for both the State Water Project and the California Energy Resources Scheduling (CERS) Division. The passage of Senate Bill 85 in August 2007 added Section 142 to the California Water Code requiring DWR to submit an annual report addressing the reductions in its greenhouse gas emissions related to water and energy use.

This report highlights the progress DWR has made in reducing its State Water Project emissions by investments in energy efficiency projects and plans to phase out a coal-fired power contract. It also characterizes the energy portfolio of CERS, which was created during California's 2000-2001 energy crisis in response to calls by the Governor and the Legislature for DWR to purchase power for California's Investor Owned Utilities.

If you have any questions, please contact me at (916) 653-7007 or your staff may contact Raphael Torres, Deputy Director for the State Water Project at (916) 653-8043.

Sincerely,

A handwritten signature in black ink, appearing to read "Lester A. Snow", with a long horizontal flourish extending to the right.

Lester A. Snow
Director

Attachments

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The California Department of Water Resources Report on Reducing the State Water Project's Dependency on Fossil Fuels

Introduction

The Department of Water Resources (DWR) is pleased to submit to the Legislature and to the Governor its report on the status of DWR's efforts to reduce its dependency on fossil fuels. The report is associated with the passage of Senate Bill (SB) 85 in August 2007, which added Section (§)142 to the California Water Code addressing the reductions in greenhouse gas (GHG) emissions related to water and energy use.

Specifically, §142(a) requires that, by March 1, 2008, and at least annually through 2015, DWR will report:

- (1) The status of any contracts it has for fossil fuel generated electricity and its efforts to reduce its dependency on fossil fuels; and
- (2) Changes to the existing energy portfolio that alters the contracts' costs, term, quantity, or composition of resources that deliver power under the contracts.

The first portion of this report focuses upon the status of the contracts and the changes to the power portfolio for the State Water Project (SWP). The second portion shows the status of DWR's California Energy Resources Scheduling Division's long-term power contract portfolio in the attached Microsoft PowerPoint document.

State Water Project Power Portfolio Overview

DWR is responsible for monitoring, conserving, and developing California's water resources, providing public safety, and preventing property damage related to water resources. The Department's mission is to ensure that all projects undertaken by DWR benefit the State and protect, restore, and enhance natural ecosystems and human environments. DWR operates California's SWP, the largest State-built multipurpose project in the United States.

DWR develops and administers a comprehensive power resources program for the strategic timing of generation and pumping schedules, purchase of power resources and transmission services, short-term sales of energy surpluses, and studies of resources for future needs. In 2006, hydroelectric generation comprised 54 percent of SWP power resources. Market based purchases and exchanges, and Reid Gardner Unit No. 4 equaled 36 percent and 10 percent, respectively.



The SWP's 2006 energy portfolio was made up of the SWP's own hydropower resources, including the Hyatt-Thermalito Pumping-Generating complex, the SWP aqueduct's recovery plants (Gianelli, Alamo, Devil Canyon, and Warne), and the Mojave Siphon generation plant.¹ The SWP receives additional hydroelectric energy and capacity through long term agreements with the Kings River Conservation District (KRCD), the Los Angeles Department of Water and Power (LADWP), and the Metropolitan Water District (MWD). With respect to non-hydroelectric energy resources used by the SWP, under the *Reid Gardner Unit 4 Participation Agreement*, DWR receives up to 67.8 percent energy from Reid Gardner Powerplant Unit 4.

Table 1 summarizes SWP generation capacity by plant facility, as well as the maximum capacity for a partial share of the energy from Reid Gardner Powerplant Unit 4.

Table 1. SWP Generation Capacity

SWP Power Plant	Capacity (MW)
Hyatt	819
Thermalito	113
Pine Flat	165
Gianelli	424
William Warne	74
Castaic	1,272
Alamo	20
Mojave Siphon	33
Devil Canyon	276
Reid Gardner Unit No. 4	275
Total Capacity	3,471

DWR's market purchases constitute the remainder of the SWP energy portfolio, including two medium-term market contracts for off-peak energy.

Federal and State legislation and policy share the collective goal of reducing carbon emissions that result from human activity (i.e., fossil fuel burning and deforestation), and increasing the use of renewable resources for energy. In the process of sustaining a dependable, cost-effective, and diverse energy portfolio mix to meet California's water and energy needs, DWR is reducing its GHG emissions and fossil fuel dependency by implementing and building upon the following strategies:

¹ Gianelli Pumping-Generating Plant is a joint DWR and U.S. Bureau of Reclamation (USBR) facility; DWR's share is 222 MW; USBR's share is 202 MW.



- A continuous balance is maintained between resources and demand on SWP's electrical system through self-generation, load management, exchange agreements, and purchase and sales transactions with other entities. DWR collects and evaluates its metered and scheduled transactions data to identify trends in energy usage and emissions associated with its legislatively mandated responsibilities. Metered and scheduled data in electronic format has been available since 1983.
- Coinciding with the Governor's Executive Order S-3-05 (*The Impacts of Climate Change*) and Assembly Bill 32 (AB 32 -- *The Global Warming Solutions Act of 2006*), DWR initiated investigations of the measures DWR needs to meet California's emissions reductions goals, which included meetings and data exchanges with the California Energy Commission and the California Air Resources Board.
- AB 32 mandates the reduction of California's GHG emissions to 1990 levels by the year 2020. DWR is currently documenting its 1990 footprint, and will have its definitive evaluation completed by the fall of 2008. Upon completion of this analysis, DWR will be able to confirm the timeframe that DWR will meet AB 32's 2020 emissions reductions requirements, as well as be in a better position to identify additional target levels and interim dates (prior to and following the 2020 benchmark year) for emissions reductions.
- DWR is currently evaluating the SWP's operational strategies and its energy portfolio, particularly since the year 2000 to the present. Historical data is being collected and analyzed in conjunction with hydrologic data, water delivery records, SWP equipment and facilities outages, and market events that shape the SWP's ability to deliver water using environmentally sensitive and sustainable energy resources and strategies.
- Beginning in 2006, and throughout 2007, DWR investigated technologies such as combined-cycle generators and combined heat and power systems to increase the percentage of cleaner, more efficient resources for the SWP.
- The SWP's hydrogeneration resources displace the energy derived from less efficient, higher carbon producing generators that would otherwise be called upon to serve California's peak electricity demands. The SWP lowers the California Independent System Operator wholesale power grid emissions by contributing clean hydroelectric generation during peak hours.
- DWR participates in the California Demand Response program through contracting to drop up to 200 MW of the SWP's pump load for up to 24 hours per month during California's peak load hours in the summer months of May through September. This service reduces GHG emissions by decreasing the amount of



peak generation served by inefficient, high carbon emitting resources.² The SWP is the largest individual demand response provider in California.

- DWR invests substantial resources in engineering feasibility and design studies to improve the overall water to energy conversion of the SWP's equipment and facilities. DWR's energy efficiency improvement programs include pump and turbine replacements, and refurbishments using state-of-the-art design and construction methods to enhance the performance of SWP's hydroelectric units. This reduces overall carbon emissions by allowing the SWP's hydroelectric units to use less energy to move more water, and to generate more power with less water. DWR's refurbishment programs for Hyatt Generation Plant, and Edmonston Pumping Plant were initiated in 2003 and will continue through 2011.
- Based upon DWR's preliminary estimate of carbon dioxide (CO₂) emissions associated with SWP operations in 2007, DWR anticipates that upon completion in 2011, the two energy efficiency projects will reduce GHG emissions by 66 thousand metric tons of CO₂ annually. Through 2020, these programs result in an estimated 2,500 gigawatt hours (GWh) energy savings, and 956 thousand metric tons of CO₂ emissions avoided.
- AB 32 mandates the California Air Resources Board (ARB) to adopt compulsory regulations for reporting of statewide GHG emissions by January 1, 2008, incorporating the standards and protocols developed by the California Climate Action Registry (CCAR). DWR's new membership in the CCAR as of June 2007, as well as the ARB's integration and expansion upon the CCAR's standards, will provide a consistent and transparent reporting mechanism for DWR to account for its CO₂ emissions, and articulate DWR's future policies for meeting California's GHG emissions reductions goals. DWR has submitted its data to CCAR and is in the process of obtaining a verifier.
- The California Public Utilities Code §8341 requires that load-serving entities not enter into a long-term financial commitment unless the baseload generation that is being supplied complies with the GHG emission performance standard established by the California Public Utilities Commission. Although DWR is not a load-serving entity as defined under this code, DWR still plans to meet the intent of this legislation.³ Since July 1983, DWR has received up to 235 megawatts (MW) of energy from a long-term agreement for partial interest in Unit 4 of the Reid Gardner Powerplant, a coal-fired facility near Las Vegas, Nevada. DWR has formally notified the owners of the plant that DWR will not extend or renew the agreement upon its expiration on July 25, 2013.

² Inefficient, high emitting "peaker" plants are generally brought on line when power demand is high, and there are no other alternatives.

³ Refer to <http://law.onecle.com/california/utilities/8341.html>, §8341, part (a).



Energy Required to Convey State Water Project Water

The electric power necessary to operate the SWP is derived from DWR's own and jointly developed hydroelectric facilities, and long-term and short-term purchase agreements. DWR enters into agreements that allow the SWP to sell, buy, and exchange capacity or energy on an hourly, daily, weekly, monthly, or seasonal basis to promote more efficient use of its generating resources and the scheduling of water deliveries. The SWP's energy portfolio includes the following resources:

Hydroelectric Generation: Hydropower falls under the definition of renewable energy, which is the "energy drawn from a source that is infinite or is replenished through natural processes. Such sources include the sun, wind, heat from the earth's core, biomass, and moving water."⁴ Clean, low carbon emitting hydroelectric generation provides a large portion of SWP power resources.

Joint Development Agreements: In 1966, DWR contracted with the Los Angeles Department of Water and Power (LADWP) for the joint development of the Castaic Powerplant. Although part of the SWP system, the Castaic Powerplant is operated by LADWP, and electrically connected to their system at the Sylmar Substation. SWP receives capacity and energy based upon LADWP's weekly water schedules.

Contractual Arrangements: DWR obtains energy through long-, medium-, and short-term purchase agreements with marketers and utilities in California, Nevada, the Northwest, and the Southwest, including:

- A run-of-river 165 MW Pine Flat hydroelectric powerplant, owned and operated by the Kings River Conservation District (KRCD).
- 30 MW total capacity from five small hydroelectric plants owned and operated by the Metropolitan Water District (MWD) of Southern California, and located at Lake Mathews, Foothill Feeder, San Dimas, Yorba Linda, and Greg Avenue in the Los Angeles area.
- A 1988 Coordination Agreement, which allows DWR to purchase surplus energy from MWD's Colorado River Aqueduct system.
- The receipt of off-peak energy of 100 MW through 2010, and 200 MW through 2015, respectively, from two market contracts. The cost of the energy is determined using the Natural Gas Intelligence Weekly Gas Price Index. These market contracts are assumed to be sourced primarily from natural gas-fired plants.

⁴ Refer to <http://www.energy.ca.gov/2005publications/CEC-300-2005-010/CEC-300-2005-010-FS.PDF>



- DWR receives energy from one of four units at the Reid Gardner coal-fired generation facility located in Moapa, Nevada. Under a participation agreement, DWR receives up to 235 MW from Unit 4, which is 90.4 percent of the unit's capacity.
- The SWP relies upon several other market contracts and exchange agreements with energy derived from unspecified sources. Consistent with the general energy mix assigned to energy contracts within the State, these contracts and agreements are assumed to reflect a mix of resources.

The SWP's energy portfolio for calendar year 2006 is summarized on the following page in Table 2.⁵

⁵ The 2006 data represents metered and market data available for the SWP. The data is subject to change, based upon the validation process for publication in Bulletin 132-07, which is currently underway.



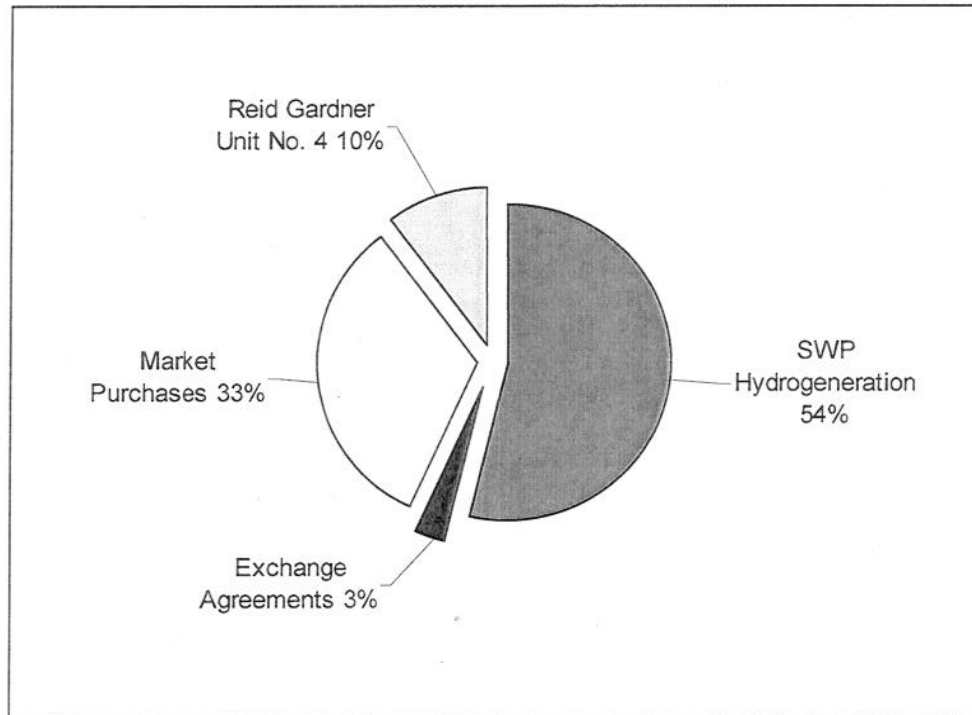
Table 2. SWP 2006 Energy Portfolio

SWP 2006 Energy Portfolio	
Source	GWh
Oroville (Hyatt-Thermalito)	3,631
Gianelli	165
Warne	293
Devil Canyon	1,434
Castaic	442
Alamo	88
Mojave Siphon	95
Pine Flat	723
Small Hydro	<u>154</u>
SWP Hydrogeneration	7,025
Exchange Agreements	367
Market Purchases	<u>4,335</u>
Purchases & Exchanges	4,702
Reid Gardner Unit No. 4	<u>1,349</u>
Non-Hydro Imports	1,349
Total Resources	13,076
Exchange Out Agreements	188
Market Sales	<u>3,465</u>
Sales & Exchanges	3,653
Grand Total	9,422



Figure 1 depicts the proportion of each resource in the SWP's energy portfolio for 2006.

Figure 1. SWP 2006 Energy Portfolio



CO₂ Emissions Accounting Methodology

Based upon the data enumerated in Table 2, estimates for the CO₂ emissions associated with the SWP 2006 portfolio are summarized in Table 3, using the emissions factors and guidelines cited in the CCAR's General Reporting Protocol. Consistent with the CCAR protocol (which also integrates data sources from three federal agencies: the Environmental Protection Agency (EPA), the Energy Information Administration (EIA), and the Federal Energy Regulatory Commission, hydroelectric, nuclear, and renewable energy resources are assigned zero carbon emissions factors. SWP's purchases and exchanges from unspecified sources are estimated using the published emissions rates of counterparties who filed their 2006 emissions with the CCAR,⁶ and the CCAR recommended Western Electricity Coordinating Council regional default factor for CO₂ Emissions in California.⁷ Reid Gardner Unit No. 4 CO₂ emissions were retrieved from

⁶ With the exception of one counterparty, whose emission rate reported to the CCAR was only available for 2005.

⁷ Emissions & Generation Resource Integrated Database (eGRID), eGRID2006 Version 2.1, April 2007 (Year 2004 data).



the EPA Clean Air Markets Division (CAMD) database.⁸ This data was used to ascertain the level of emissions for the actual energy imported into California by DWR from Reid Gardner Unit No. 4.

Table 3. SWP Energy Portfolio CO₂ Emissions in 2006

Estimated 2006 State Water Project Carbon Dioxide (CO₂) Emissions		
Portfolio	GWh	CO₂ (Million Metric Tons)
Energy Resources	13,076	3.48
Sales & Exchanges	<u>3,653</u>	<u>1.34</u>
Net SWP Emissions	9,423	2.14

DWR Membership in the California Climate Action Registry

To track the emissions associated with SWP operations and bulk power transactions using a standard mechanism, DWR will report its overall energy use and GHG emissions starting with the year 2007 (and for each year thereafter) using the CCAR's web-based Climate Action Registry Online Tool. The annual reports will be based on the CCAR's General Reporting Protocol and the Power/Utility Reporting Protocol; the latter focuses upon GHG emissions for the electric power and utility sectors.

Phasing Out Carbon-Intensive Energy Resources

The electric power needed to operate the SWP comes from its own and jointly developed hydroelectric facilities, long-term and short-term purchase and exchange agreements, and a thirty-year agreement with NPC. Since July 25, 1983, DWR has received up to 235 MW from Unit 4, one of four units at the Reid Gardner coal-fired generation facility located in Moapa, Nevada. Upon contract expiration, DWR intends to replace this coal based thermal energy with a combination of cleaner, more efficient resources, improvements to the SWP system, and renewable energy resources.

⁸ NPC reports emissions to the EPA CAMD on a quarterly basis, based upon direct measurements acquired through its continuous emissions monitoring (CEM) system.



Investment in Low Emissions Technologies for the SWP

CO₂ emissions from electric power generation are influenced by the efficiency factors associated with converting fossil fuels into electricity, as well as the type of fuel used. Emissions factors associated with coal-fired generation are almost twice that of natural gas powered generation. In a typical power plant, only 30 percent of the energy is actually converted into electricity. Improvements in generation efficiency by replacing traditional power generators with more efficient technologies can result in lower CO₂ emissions. Consequently, DWR is investigating ownership interest and contractual agreements in technologies such as combined-cycle generators, and combined heat and power systems. Energy from combined cycle gas turbines is rated for emissions that average 800 pounds CO₂ per MWh. The first phase of investigations are complete. Final studies include obtaining a plant license from the California Energy Commission for a new state-of-the-art combined-cycle gas plant.

SWP Operational Flexibility and Energy Efficiency Programs

Comparing hydropower to fossil fuel plants, hydroelectric power plants avoid increased releases of GHGs, making a substantial contribution to diminishing emissions. Consistent with the spirit of AB 32, achieving high levels of efficiency of pumps and generators is one of the key strategies DWR applies to stabilize the costs of delivering water, and to help California meet the GHG emission reduction goals. The Edmonston Pumping Plant and Edward Hyatt Powerplant are two SWP facilities where major energy efficiency projects have been undertaken. Based upon DWR's draft estimate of CO₂ emissions associated with SWP operations for 2007, DWR anticipates that upon completion in 2011, the two energy efficiency projects will reduce GHG emissions by 66 thousand metric tons of CO₂ annually. DWR is currently evaluating the feasibility of proceeding with additional energy efficiency upgrades at Edmonston, scheduled to start in 2013 and extend through 2020.

Table 4 illustrates the cumulative energy savings and fossil fuel emissions equivalents associated with the energy efficiency improvements to the SWP from 2003 through 2020. This table applies DWR's updated methodology for assessing the emissions savings that result from the SWP energy efficiency improvements programs. Specifically, for this forecast, DWR applied the weighted average of its 2007 emissions rates from the SWP's market purchases and exchanges.⁹

⁹ In earlier assessments, DWR applied its emissions rate associated with its *overall* carbon footprint, which includes its hydroelectric energy resources which constitute zero emissions energy.



**Table 4. SWP Energy Efficiency and Emissions Reductions
Years 2003 – 2020**

Energy Efficiency Program	Cumulative Energy Savings (megawatt hours)		Cumulative Emissions Reductions (metric tons CO ₂)		Equivalent Emissions Savings
Years	Hyatt Generation	Edmonston Pumping	Hyatt Generation	Edmonston Pumping	Automobile Equivalents
2003-2007	306,949	5,951	117,753	2,283	21,985
<u>2008-2020</u>	<u>1,721,443</u>	<u>763,000</u>	<u>660,386</u>	<u>175,297</u>	<u>174,559</u>
Total by Plant	2,028,392	768,951	778,139	177,580	196,543
CUMULATIVE TOTAL	2,797 gigawatt hours		0.95 million metric tons CO₂		196,543 autos

In 2006, DWR completed the construction of a new reservoir known as the Tehachapi East Afterbay. The reservoir provides water storage for the SWP's "Valley String" pumping plants,¹⁰ reduces pumping during peak demand periods, and provides ancillary services to California's energy grid. The reduction in peak energy demands diminishes reliance on "peaker" plants that provide extra power during periods of peak usage but generally not as efficient and produce higher GHG emissions.

The Tehachapi Second Afterbay allows for sufficient storage upstream to accommodate an additional small hydrogeneration unit at the Alamo Powerplant, which is located in Southern California. DWR performed a feasibility study to determine the viability of adding a second unit (rated at 14 MW) and the benefits derived from the additional hydroelectric generation capacity. The Alamo project is currently in its planning and environmental phase. The final design of the unit is scheduled to start in December, 2009, and be operational in 2017, which coincides with the completion date for Phase II of the East Branch Extension project.

DWR is continuing to investigate additional opportunities for increasing SWP operational flexibility through decreasing pumpload demand and increasing the hydrogeneration availability.

¹⁰ Dos Amigos, Buena Vista, Teerink, Chrisman, and A.D. Edmonston.



Conclusion

DWR will continue its role as the State's third largest generator of clean hydropower. DWR is currently investigating ownership interest and contractual agreements to not only replace the 10 percent of its resources provided by coal generation, but also to reduce its overall dependency on fossil fuels. This can be accomplished with technologies such as combined-cycle generators and combined heat and power systems to replace the coal-based energy with a combination of cleaner, more efficient resources, improvements to the SWP system, and renewable energy resources. DWR's membership in the CCAR, as well as the ARB's reporting regulations which integrate and expand upon the CCAR's standards, will provide a consistent and transparent reporting mechanism for DWR to track its CO₂ and GHG emissions and to evaluate its progress in meeting and exceeding California's GHG emissions reductions goals.

**Report to the Governor and Legislature
in Compliance with the Requirements of
Section 142 of the Water Code**

**Status of
California Energy Resources Scheduling Division
(CERS)
Long-Term Power Contract Portfolio**



January 29, 2008

CERS Contract Overview

Number of original agreements: 58

Original portfolio projected cost: \$42.5 billion

Number of agreements remaining: 26

Current Projected remaining balance portfolio cost: \$12.6 billion

Portion of portfolio cost that is the cost of natural gas: \$5.2 Billion

Changes to Portfolio

Total portfolio cost for 2008 and 2009 was reduced by \$1 billion resulting from amending the Calpine 2 contract.

The original Calpine 2 contract provided 1,000 MW of electricity around the clock through 2009 at an annual cost of \$522 million.

The amended contract provides ownership rights to 180 MW of peaking capacity from the Calpine Los Esteros facility in the Silicon Valley for 2 years with an option for an additional 3 years at an annual cost of \$4.5 million.

No other changes to the cost, term, quantity, or composition of resources used to provide electricity from the portfolio are expected in the coming year unless such changes are part of resolving on-going litigation with the suppliers.

The Supreme Court is currently hearing a case challenging the “reasonableness” of long-term power contracts signed during the Western energy crisis of 2000-2001. A decision favorable to California would result in the Federal Energy Regulatory Commission (FERC) reviewing the reasonableness of the pricing terms of some of the CERS contracts.

Summary of Current CDWR-CERS Contracts Portfolio

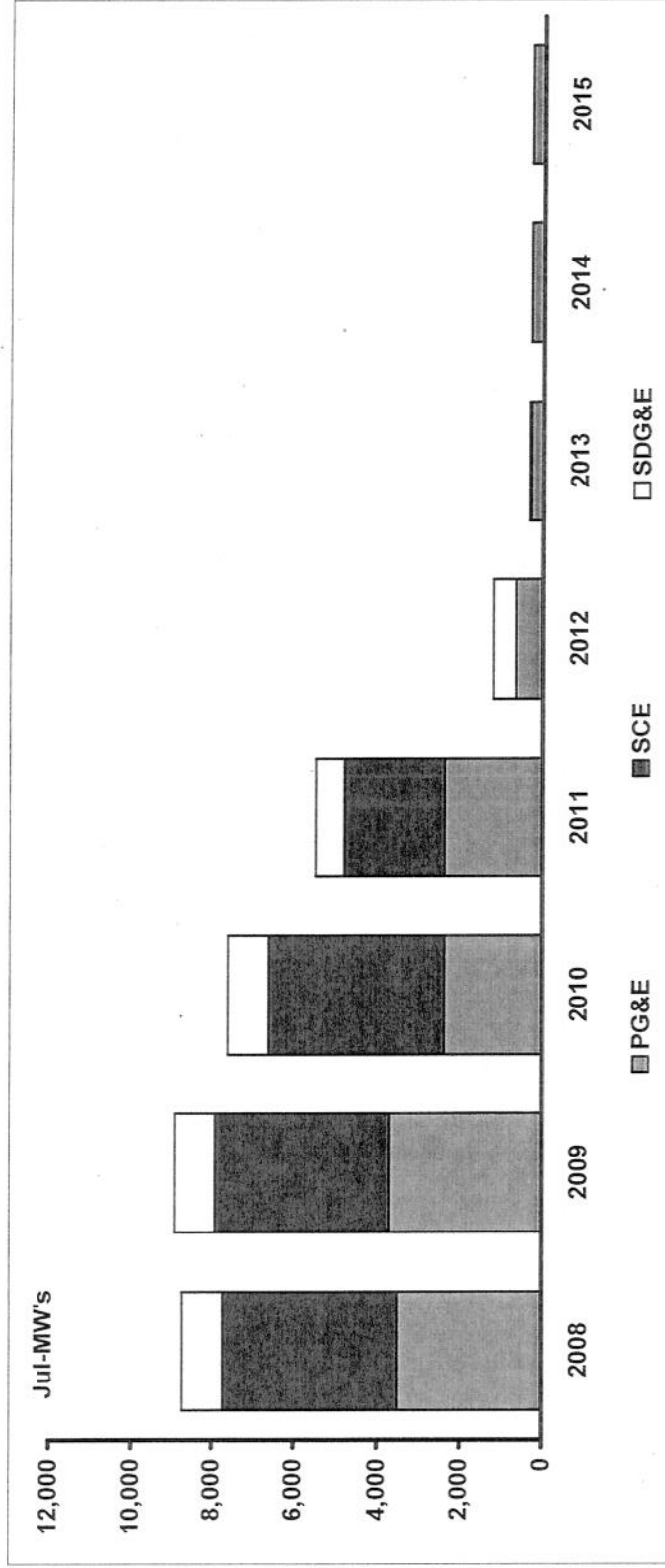
Contract Types	Contracts by IOU Allocation (Contracts in Effect 2008)		
	PG&E	SCE	SDG&E
Market Resources (Fixed Price & Quantity)	Calpine 1	Goldman Sachs	Williams - Product B&C
		Williams Gas Supply Contract	Williams Gas Supply Contract
Portfolio of Resources (May also be provided from market)	Coral	Sempa	
	Pacificorp		
Unit Specific Resources (Dispatchable, except 3 wind contracts)	Calpeak (Panoche)	Colton Power	Calpeak (Border)
	Calpeak (Vaca-Dixon)	High Desert	Calpeak (El Cajon)
	Calpine 2 (Reneg.)	Mountainview Wind	Calpeak (Enterprise)
	Calpine 3	Williams D	Sunrise
	CCSF		Shell Wind Energy (Cabazon)
	GWF		Shell Wind Energy (Hill)
	KRCD		
	Wellhead (Fresno)		
	Wellhead (Gates)		
	Wellhead (Panoche)		

Expiration Dates of CDWR-CERS Contract Portfolio

Contracts in Effect 2008 (Year-end expiration unless otherwise noted)						
2008	2009	2010	2011	2012	2013	2014
	Calpine 1	Colton Power (Oct-'10)	Calpeak(s) (2 projects Oct-'11, 3 projects Dec-'11)	Calpine 2 (renew.) Coral (Jun-'12)	Shell Wind Energy (Cabazon) Shell Wind Energy (Hill)	
		Williams (Product B,C,D)	Calpine 3 (Jul-'11)	GWF Ph3 (Oct-'12)		Kings River (May-'15)
		Williams Gas	Goldman Sachs	Sunrise (Jun-'12)		CCSF
			GWF (Phase 1 & 2)			
			High Desert (Mar-'11)			
			Mountview Wind (Sept-'11)			
			Pacificorp (Jun-'11)			
			Sempra (Sept-'11)			
			Wellhead(s) (Oct-'11)			
Contract MW's Expiring* (non-coincident)						
	1,000	1,450	4,640	1,450	100	290

(*) MW's shown were available during all or part of the calendar year that will not be available the following year.
Contract MW's expiring are non-coincident and not cumulative due to expiration date and annual MW's may vary.

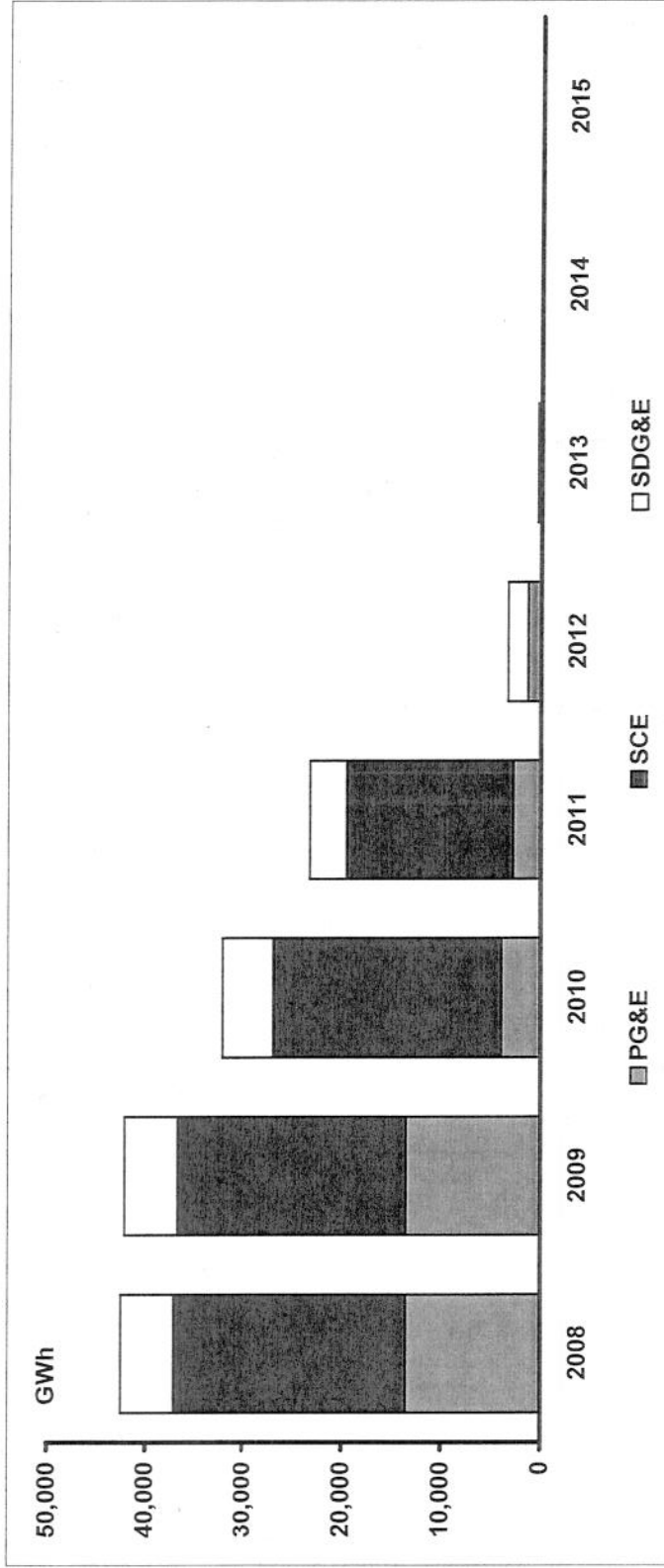
Summary of CDWR-CERS Contract Capacity (MW's) (By IOU Contract Allocation)



Contract Capacity (Jul-MW)	2008	2009	2010	2011	2012	2013	2014	2015
PG&E	3,510	3,700	2,370	2,370	630	280	280	280
SCE	4,220	4,220	4,220	2,420	0	0	0	0
SDG&E	1,020	1,010	1,010	690	550	40	0	0
TOTAL	8,750	8,930	7,600	5,480	1,180	320	280	280

Data: CDWR-CERS revenue requirement model (PM9 w/ Calpine renegotiated).

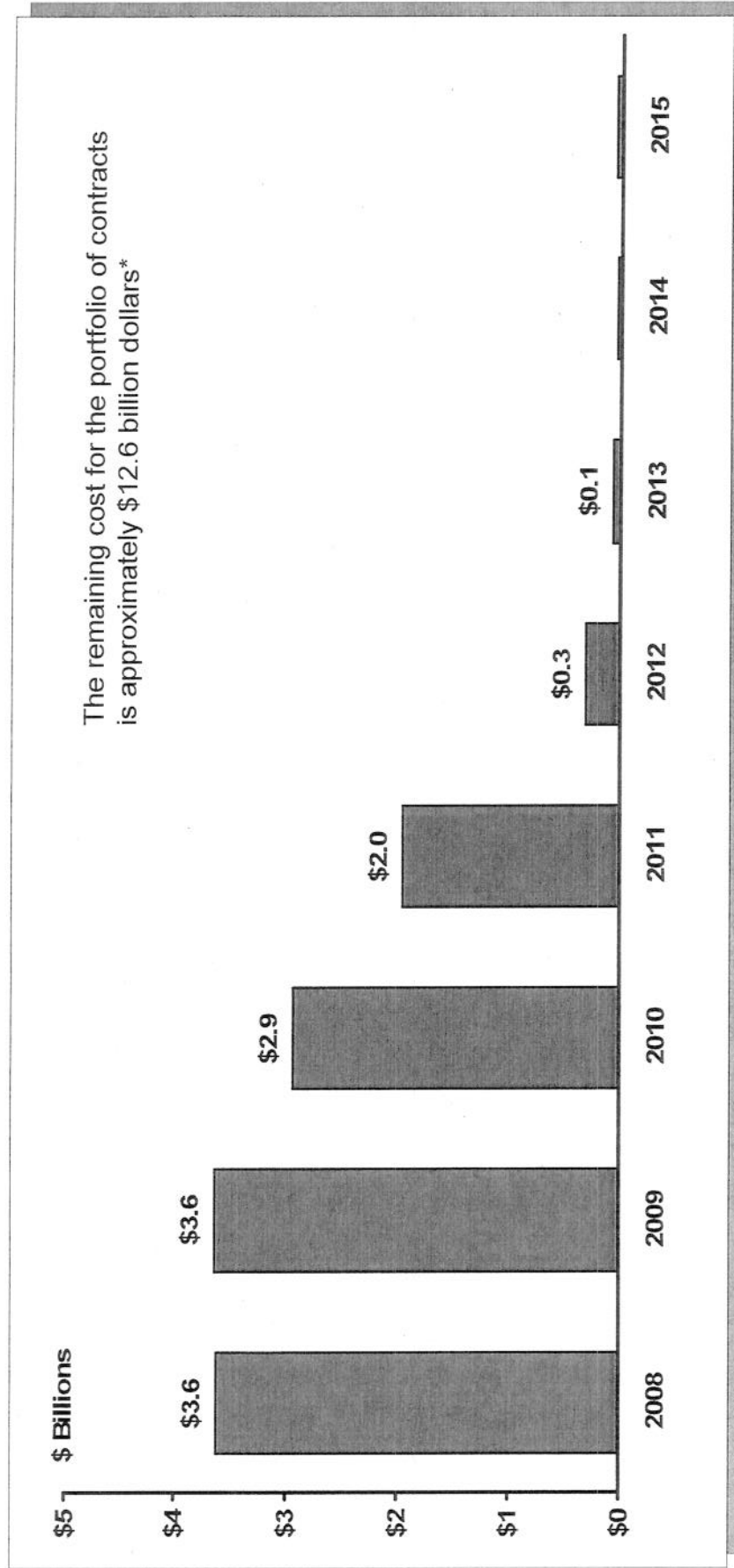
Summary of Contract Energy (GWh) (By IOU Contract Allocation)



Contract Energy (GWh)	2008	2009	2010	2011	2012	2013	2014	2015
PG&E	13,500	13,500	4,000	2,800	1,300	10	20	90
SCE	23,600	23,200	22,900	16,700	0	0	0	0
SDG&E	5,400	5,400	5,300	3,700	2,000	290	0	0
TOTAL	42,500	42,100	32,200	23,200	3,300	300	20	90

Data: CDWR-CERS revenue requirement model (PM9 w/ Calpine renegotiated).

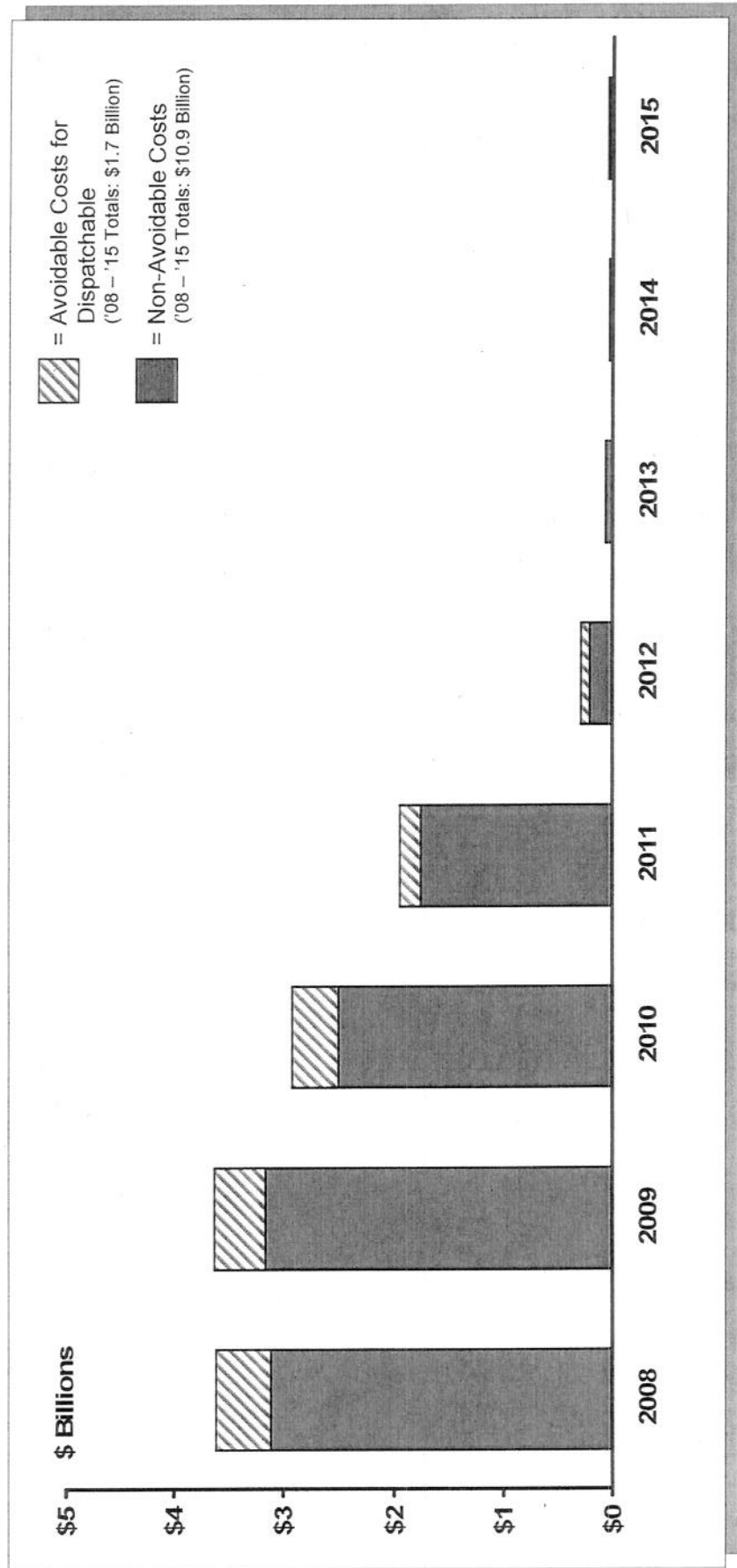
Summary of CDWR-CERS Contract Costs – 2008 thru 2015



Note: Data from CDWR-CERS revenue requirement model (PM9 w/ Calpine renegotiated).
 (*) Annual projections may vary due to updates to gas price forecasts, contract utilization, and other assumptions.
 Excludes Williams Gas Supply Contract, revenue from surplus energy sales, bond charges, reserves, and other costs.

Summary of CDWR-CERS Contract Costs – 2008 thru 2015 (cont.)

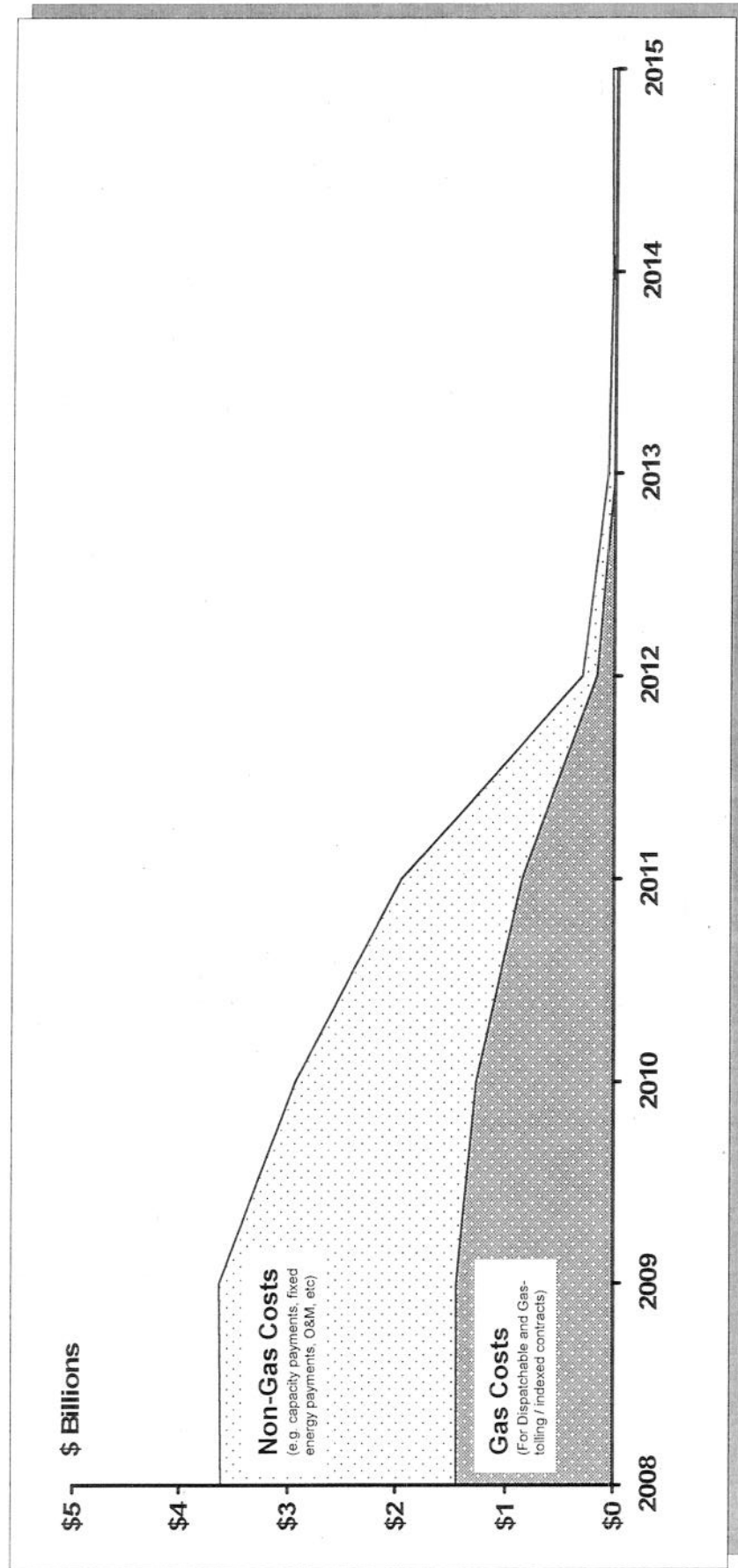
(Additional breakdown between Non-Avoidable and Avoidable Costs)



Note: Data from CDWR-CERS revenue requirement model (PM9 w/ Calpine renegotiated).
 (*) Annual projections may vary due to updates to gas price forecasts, contract utilization, and other assumptions.
 Excludes Williams Gas Supply Contract, revenue from surplus energy sales, bond charges, reserves, and other costs.

Summary of CDWR-CERS Contract Costs – 2008 thru 2015 (cont.)

(Of the remaining \$12.6 Billion contract costs, \$5.2 Billion (41%) is for natural gas costs)



Note: Data from CDWR-CERS revenue requirement model (PM w/ Calpine renegotiated).

(*) Annual projections may vary due to updates to gas price forecasts, contract utilization, and other assumptions.

Excludes Williams Gas Supply Contract, revenue from surplus energy sales, bond charges, reserves, and other costs.